

Work Order ID 57623

April 12, 2010 8:50:50 AM



Page 1

Item ID: D205-634-041

Accept



Setup Start



Revision ID:

Item Name: Replacement Skidtube

Stop



Start Date: 12/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 04/05/2010 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan: *PL*

Date: *10-11-12*

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	----------------	--------------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D2580	Rev D

100



DOCUMENT CONTROL

0.00

DC

Memo

0.00

Document Control

Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG002

N/A

110



BENDING MACHINE - SKIDTUBES

0.00

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio FT009

2-Cut tubes as per Dwg. D2580

4/10/4/22

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120		0.00							
Skidtubes	Memo	0.00							
Skidtubes	1- Deburr ends								
	2- C'sink holes as per dwg without cutting fluid								
	3- Prepare tube for welding, remove alodine as required.								
	4- Scribe batch number insied aft end of tube.								
130	QC5- Inspect part completeness to step on W/O	0.00							
QC	Memo	0.00							
Quality Control									

11/01/4/23

8 10/04/23

70

W/O:		WORK ORDER CHANGES					
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Stop



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140

0.00



Skidtubes

Memo

0.00

Skidtubes

1-Weld step D2576 as per Dwg. D2580 and QSI 004

A/R□□□ Aluminum Rod

MIL3207

BE 10/04/26

2-Prep per QSI 005 and weld crossbolt spacers D2579 as per Dwg. D2580, QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill

A/R□□□ Aluminum Rod

MIL3207

BE 10/04/26

3-Grind welds as per Dwg D2580 Grind flush ridge made from bending

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64", adjust stopper not to hit web. Debur

5-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580. Debur holes

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Debur

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Debur

AWM 10-4-27

W/O:		WORK ORDER CHANGES					
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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

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150



QC

Quality Control

QC10- Inspect visual per QSI004- ground welds

0.00

8/6/04/28

0.00

Memo

160



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

8/6/04/28

0.00

Memo

170



HandFinish

Hand Finishing

Pressure Wash per QSI005 4.3

0.00

0.00

Memo

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.

D BK 10-4-28.

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Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

180

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00



Powdercoat

Memo

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

2:45pm
320°F
3:15pm

0.00

=> 41 10/04/2F

1

0

190

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

=> m k w/04/2a



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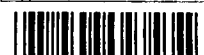
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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200

0.00



HandFinish

Memo

0.00

Hand Finishing

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291 ☐

Sikaflex expire date:

10/08

M112429

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291 ☐

Sikaflex expire date:

10/08

M112429

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch:

M113545

mk 10/04/29
(1X)

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Reference:

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

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Stop

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210


QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

220


Packaging

Packaging

Packaging

0.00

Memo

0.00

Identify and pack for shipping as per PPPD205-634-041

Location:

PPP Rev: PPA 57196

230


QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

8/10/4/30

(70)

10/5/3

10/05/04
10-5-04

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 IPP Rev P 10.02.19 per PAR09-043 EC verified by:DD
 IPP Rev. O 06.02.28 Added paperwork EC
 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Date: 12/04/2010

Required Date: 04/05/2010

Start Qty: 1.00

Required Qty: 1.00

D2580-1 Manufactured No 110 Each 5.0000 1.0000



205 Skidtube bent detail

B-57437 MB 10-04-22

Warehouse Loc Qty Loc Code

Location

Main Warehouse

LG

5

56975

2

57028

2

57188

1

D2576-3 Manufactured No 140 Each 121.0000 1.0000



Step (maching detail)

Warehouse Loc Qty Loc Code

Location

Main Warehouse

LG

121

46661

73

52215

48

D2579 Manufactured No 140 Each 113.0000 20.0000



Crossbolt Spacer

Warehouse Loc Qty Loc Code

Location

Main Warehouse

LG

113

57052

113

1 BE 10/04/20

20 BE 10/04/20

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 IPP Rev. O 06.02.28 Added paperwork EC
 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Qty: 1.00

Required Qty: 1.00

D2855 Manufactured No 200 Each 119.0000 1.0000



Cap



<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
Main Warehouse		
FP6	2	
56613	2	
Main Warehouse		
ST026	117	
50513	1	
50770	30	
51539 ✓	32	
53791	54	

AN3-5A Purchased No 200 Each 1,021.000 2.0000



Bolt



<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
Main Warehouse		
ST350	1021	
105057 ✓	1021	

10/04/29

IX m-h

IX m-h 10/04/29

April 12, 2010 8:50:55 AM

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 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Date: 12/04/2010

Required Date: 04/05/2010

Start Qty: 1.00

Required Qty: 1.00

AN960JD10L Purchased No 200 Each 4,685.000 2.0000



Washer

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST348

4685

110985 ✓

4685

ALS7-1032-130 Purchased No 200 Each 409.0000 50.0000



Insert

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST282

409

113238

409

AN3C4A Purchased No 200 Each 1,499.000 50.0000



BOLT

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST350

1499

113226

98

114103

501

114108

400

114330 ✓

500

10/04/29

2x m-h

50x m-h

10/04/29

22x m-h 10/04/29

28x m-h 10/04/29

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Dart Aerospace Ltd

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Start Date: 12/04/2010

Required Date: 04/05/2010

Start Qty: 1.00

Required Qty: 1.00

AN960C10L

Purchased No

200

Each

0.0000

50.0000



NAS1149C0332R

M114341



50x m-l
w/04/29

washer

D3566-13

Manufactured No

200

Each

53.0000

1.0000



Gasket

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

FP

53

53461 ✓

53

1x m-l
w/04/29

D3566-5

Manufactured No

200

Each

11.0000

1.0000



Gasket

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

FP015

11

56829

11

B 57526

1x m-l
w/04/29

D3566-1

Manufactured No

200

Each

22.0000

2.0000



Gasket

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

FP015

22

57257 ✓

22

2x m-l
w/04/29

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Start Qty: 1.00

Required Qty: 1.00

D3564-11

Manufactured No

200

Each

1.0000

1.0000



Wearshoe

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

FP19

56834

B 57254

1

1

200

Each

22.0000

1.0000

D3564-13

Manufactured No



Wearshoe

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

FP

56285

Main Warehouse

FP17

56533

4

4

18

18

1x m-l
10/04/29

1x m-l
10/04/29

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Start Date: 12/04/2010

Required Date: 04/05/2010

Start Qty: 1.00

Required Qty: 1.00

D3564-9 Manufactured No 200 Each 13.0000 1.0000



Wearshoe

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
Main Warehouse		
FP	1	
55334	1	
Main Warehouse		
FP019	12	
57260 ✓	12	

D3564-5 Manufactured No 200 Each 13.0000 1.0000



Wearshoe

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
OFFSHORE		
FG	2	
34806	2	
Main Warehouse		
FP	11	
55024	1	
55333	10	

B57525

1x m-h
12/04/29

April 12, 2010 8:50:55 AM

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Required Date: 04/05/2010

Start Qty: 1.00

Required Qty: 1.00

D2594-3 Manufactured No 200 Each 220.0000 16.0000
 O-Ring, 205 Skidtube

Warehouse	Location	Loc Qty	Loc Code
Main Warehouse	FP	220	
	55546 ✓	220	

D2594-1 Manufactured No 200 Each 427.0000 16.0000
 Plug, 205 Skidtube

Warehouse	Location	Loc Qty	Loc Code
Main Warehouse	FP	427	
	42807 ✓	112	
	55002 ✓	315	

16x m-h w/04/29

16x m-h w/04/29

April 12, 2010 8:50:55 AM

Shop Packet Print

Page 7

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART

DESIGN <i>[Signature]</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY SCALE NTS	
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

RELEASED
07-06-28 #

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

SHAW-WALKER
P. TURNER
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 57623

BS10-4-12

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
SEE NOTES ON
PAGE 2 FOR D2580-041 AND
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

RELEASED
07-06-28

Diagram illustrating the grinding locations for the propeller cross-section. The diagram shows a cross-section of a propeller with the following labeled areas:

- GRIND FLUSH (4 PLACES)
- GRIND FLUSH
- D2576-3 STEP
- LOCATION RIDGE ON UNDERSIDE OF D2576

Diagram illustrating the rear view of the cap assembly. The assembly includes an AN3-SA BOLT (1), AN960JD10L WASHER (1), and D2855 CAP. The bolt and washer are used to secure the cap. The cap is sealed with SIKAFLEX-241/-291. A dimension of 0.40 is indicated for the distance from the center of the bolt to the edge of the cap.

D2579 SPACER

D2596 WEB (REF)

ALS7-1032-130 (REF)
(TYP 50 PLACES)

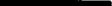
AFTER PERFORM

1. CHA
2. INS
3. WE
4. C'B

i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

[illegible]

Figure 1: Typical cross-section of a road with a 10% superelevation. The diagram shows a road cross-section with a 10% slope. Key dimensions include a 1.4m shoulder width on the left, a 1.0m distance between the hole and the tangent point, a 13.4m distance from the hole to the centerline, a 20.0m distance from the centerline to the hole, a 32.0 ± 1.0m distance from the hole to the right edge, and a 1.0m distance between the hole and the tangent point on the right. A 90,640 value is also indicated near the right edge.

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DATE 07.02.27				TITLE 205 SKIDTUBE ASSEMBLY	SCALE 1:24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

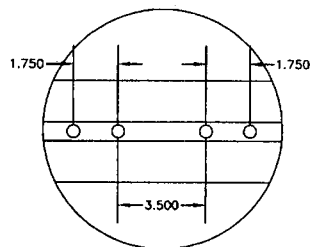
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

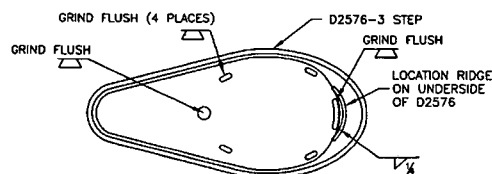
NOTE: Date & initial all entries

DETAIL E
SCALE 5:24

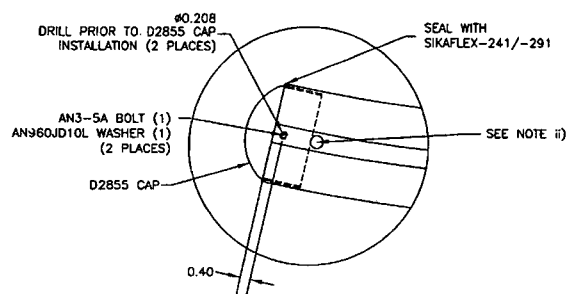


RELEASED
07.02.27

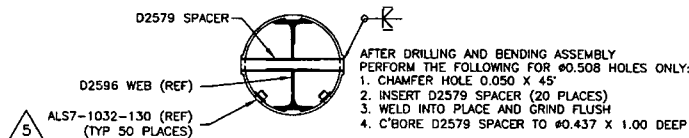
DETAIL F
SCALE 5:24



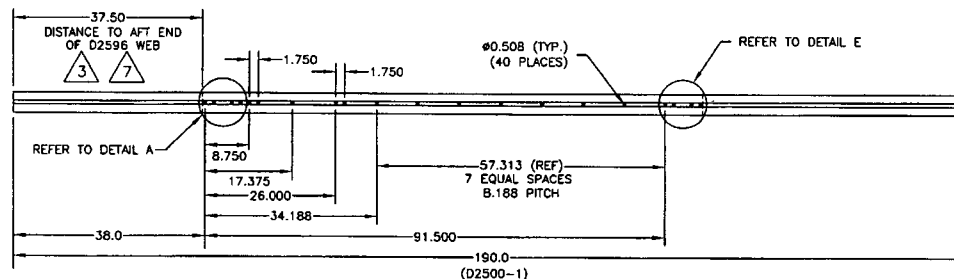
DETAIL G
SCALE 5:24



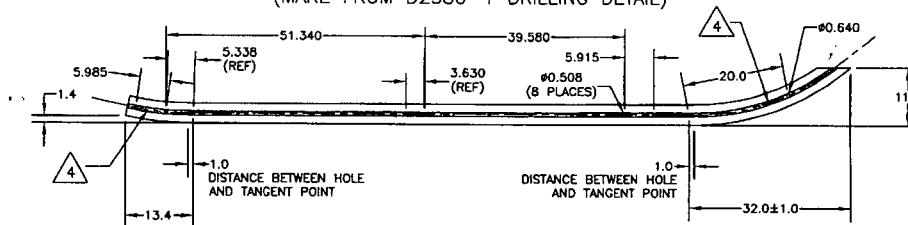
SECTION H-H
SCALE 5:24



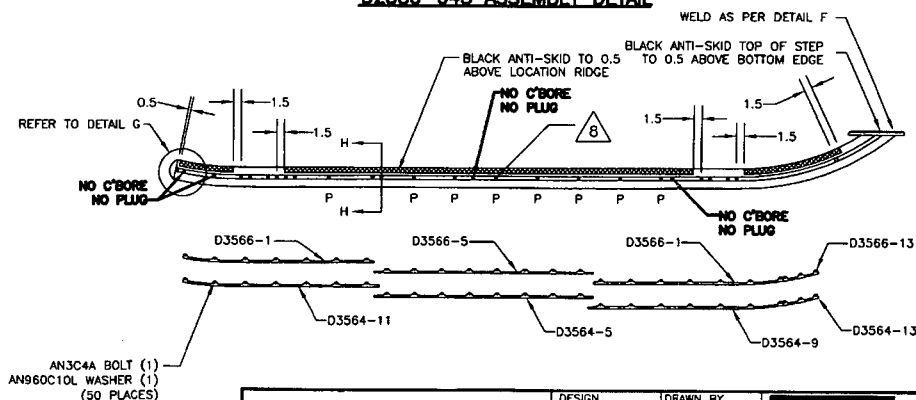
D2580-1 DRILLING DETAIL



D2580-5 BENDING AND CUTTING DETAIL
(MAKE FROM D2580-1 DRILLING DETAIL)



D2580-045 ASSEMBLY DETAIL



D2580-045 NOTES

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION

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DESIGN RH	DRAWN BY RH	DART	DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED H	APPROVED H	DRAWING NO. D2580	REV. D SHEET 3 OF 3
DATE 07.02.27	TITLE 205 SKIDTUBE ASSEMBLY	SCALE 1:24	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NO. 220

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barday Elliott
Job number: 576830
Part number: D205-634.041
Description: 205 skid tube
Welding Process: Tig[☒] Mig[]
Base material: Aluminium
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier [Signature] Date of Test Coupon 10.04.27

Welder [Signature] Date of Test Coupon 10.04.27

The above named individual is qualified in accordance with AWS D17.1.2001 to weld